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COMMON ACRONYMS/ABBREVIATIONS USED IN CHAPTER 7

ACEP – Agricultural Conservation Easement Program
BMP – Best Management Practices
CFU – Colony Forming Unit
CRP – Conservation Reserve Program
DD - Detention basin retrofit projects
DFPAI - Flood problem areas
DFS - Potential regionally significant flood storage sites
DL - Lake shore erosion control practices
DPD - Problem discharge locations
DPH - Problem hydrologic impediments
DPP - Previously planned actions
DPR planning area – Des Plaines River Watershed Planning Area
DRWW – Des Plaines River Watershed Workgroup
DSB - Stream buffers
DSG - General site-specific BMPs
DST = Stakeholder identified specific BMPs
DWS - Wetland restoration and creation sites
EQIP – Environmental Quality Incentives Program
FEMA – Federal Emergency Management Agency
FSA – Farm Service Agency
GCS – Grade Control Structure
IDNR – Illinois Department of Natural Resources
Illinois EPA – Illinois Environmental Protection Agency
INLRS – Illinois Nutrient Loss Reduction Strategy
LCFPD – Lake County Forest Preserve District
LCHD – Lake County Health Department
LMU – Lakes Management Unit
NGRREC – National Great Rivers Research and Education Center
NRCS – Natural Resources Conservation Service
QAPP – Quality Assurance Project Plan
RCPP – Regional Conservation Partnership Program
SBD - Streambank erosion practices
SMC – Lake County Stormwater Management Commission
SSD - Windshield survey identified site-specific BMPs
SWCD – Soil and Water Conservation District
SWG – State Wildlife Grant
TKN - Total Kjeldahl Nitrogen
TMDL – Total Maximum Daily Load
TOC – Total Organic Carbon
TSS – Total Suspended Solids

US EPA – United States Environmental Protection Agency

USDA – United States Department of Agriculture

USFWS – U.S. Fish and Wildlife Service

USGS – United States Geological Survey

VLMP – Illinois Volunteer Lake Monitoring Program

WASCOB – Water and Sediment Control Basin

WRAPP – Wetlands Restoration and Preservation Plan

WWTP – Wastewater Treatment Plant

7 PLAN IMPLEMENTATION AND EVALUATION

This chapter identifies a strategy and provides guidance to support transition from planning to implementation and to evaluate the effectiveness of implementation toward the goals and objectives of the plan. The primary components of this chapter include:

- Pollution load reduction estimates of action recommendations
- Estimated costs of plan implementation
- Leaders and supporters for plan implementation
- Initial steps for plan implementation
- Funding resources and opportunities
- Implementation schedule
- Evaluating plan performance
- Indicator and milestone grading system
- Water quality monitoring strategy
- Updating the watershed plan

How readily this plan is used and implemented by DPR planning area stakeholders is a major indicator of its success and is easily measured by tracking the actions taken. Improvement in watershed resources or water quality are other indicators of success achieved through monitoring. Successful plan implementation will require significant cooperation and coordination among lead and support partners to secure and allocate resources and apply them to actions in the DPR planning area. The watershed-based plan can be considered a living document and has the flexibility for stakeholders to make revisions over time that reflect shifts in local priorities or watershed conditions.

7.1 ESTIMATE OF POLLUTANT LOAD REDUCTIONS AND TARGETS

Pollution load estimates were made using the nonpoint source model described in Chapter 4. The purpose of estimating pollutant load reductions and targets in the DPR planning area is to present a general idea of BMP implementation benefits and to outline the practices that result in the greatest benefit to the watershed and achieve plan goals.

Load reduction estimates were **not** performed for all actions identified in Chapter 6; estimates were made for projects with specific on-the-ground locations, where project information was collected and reduction efficiencies are available in literature sources. Many actions presented in Chapter 6 are planning level actions, and do not have the detail of information at this time to support load reduction estimates; estimates are calculated for individual implementation projects during the design stage of the project as site information is generated. Table 7-1 includes the categories of projects for which load reduction estimates are made, and Table 7-2 outlines the average expected removal efficiencies that were applied; certain project categories have ranges in efficiencies due to variations in contributing watershed area.

Table 7-1: Project Categories Inclusive of Load Reduction Estimates

ID CODE	PROJECT SPECIFIC ACTION CATEGORY	INCLUDED IN LOAD REDUCTION ESTIMATES
SSD	Windshield survey site-specific best management practice projects	Yes[1]
DST	Stakeholder identified site-specific best management practice projects	Yes[1]
CC	Cover Crops	Yes[2]
RVR	Runoff Volume Reduction Practices	Yes
FAM	Feed Area Management	Yes
TIL	No-Till/Strip-Till	Yes
NU	Nutrient Management	Yes
PE	Pasture Enhancement[4]	Yes
ICE	De-icing Practices/Salt Management	Yes
WLR	Wetland Creation/Restoration practices	Yes
WLE	Wetland Enhancement practices	Yes
SBD	Streambank erosion practices	Yes
DSB	Stream buffers	Yes
DL	Lake shore erosion control practices	Yes
DD	Detention basin retrofit projects	No
DPD	Problem discharge locations	No
DPH	Problem hydrologic impediments	No
DFPAI	Flood problem areas	No
DFS	Potential regionally significant flood storage sites	No
DWS	Wetland restoration and creation sites	Yes
DPP	Previously planned actions	Yes[3]

[1]Load reductions are not calculated for stakeholder identified practices that lack sufficient information from which to calculate load reductions or may not result in directly measurable reductions. These practices can include: education, planning, invasive species removal, general flooding issues etc. [2] Load reductions only calculated for the footprint of high priority WRAPP sites. [3] Tabulated from previous watershed-based plans and includes all reported load reductions; some actions do not have associated reductions. [4] Pasture Enhancement includes practices such as fencing, grass planting, watering system, diversions, etc…

Table 7-2: Best Management Practice Average Expected Load Reduction Efficiencies

BEST MANAGEMENT PRACTICE	NITROGEN REDUCTION	PHOSPHORUS REDUCTION	CHLORIDE REDUCTION	SEDIMENT REDUCTION	BACTERIA REDUCTION
Site-Specific (SSD/DL/SBD/DST/DSB)					
Bioswale	10%	55%	45%	65%	45%
Wetland Restoration/Creation	10%-55%	5%-65%	5%-25%	10%-70%	15%-65%
Detention/Retention	25%-30%	40%-55%	15%-25%	60%-70%	45%-55%
Sediment Forebay	20%-40%	20%-60%	15%-25%	20%-50%	45%-55%
Grass Conversion	90%	80%	45%	90%	60%
Water and Sediment Control Basin	20%	60%	25%	70%	35%
Filter Strip/Riparian Buffer/Field Border	20%-30%	30%-40%	10%-20%	45%-60%	25%-45%
Grass Waterway	30%	25%	30%	45%	50%
Porous Pavement	35%-45%	45%-50%	50%-60%	70%-80%	35%-40%
Road Salt Management	0%	0%	25%	0%	0%
Grade Control Structure	10%	20%	20%	30%	25%
Streambank Stabilization	100%	100%	N/A	100%	N/A
Basin-Wide Site-Specific (CC/ICE/RVR/NU/WLR/PE/FAM/TIL)					
No-Till / Strip-till	10%	50%	0%	70%	20%
Cover crop (all crop)	30%	30%	0%	40%	35%
Feed Area Management	85%	83%	5%	79%	80%
Pasture Enhancement	30%	40%	20%	60%	45%
Runoff Volume Reduction	25%	40%	15%	60%	45%
De-icing Practices/Salt Management	0%	0%	25%	0%	0%
Nutrient Management Plan (All crop ground)	15%	7%	0%	0%	0%
Wetland Creation/Restoration (only wetland footprint)	90%	90%	90%	90%	90%

7.1.1 Reduction Estimates for Site Specific Actions

Load reduction estimates are provided for the majority of project/site-specific recommendations throughout the DPR planning area that are summarized in the action plan (Chapter 6) and detailed in Appendix N. Load reductions also include basin-wide site-specific BMPs, streambank, and lake shoreline stabilization BMPs. The suite of projects would benefit over 127,427 acres if fully implemented.

Table 7-3 summarizes load reductions from previously planned subwatersheds in the DPR planning area. Load reductions from previously planned subwatershed projects that have already been implemented may not be considered in Table 7-3. Efforts were made to avoid overlap with the location of previously planned BMPs and associated load reductions. Previous watershed-based plans for subwatersheds applied a wide variety of techniques for modeling and estimating load reductions, as well as different approaches to the identification of BMPs.

Figure 7-1: Proposed no-till and cover crops

Table 7-4 through Table 7-5 summarizes the annual load reduction estimates by project type for all new BMPs identified for the DPR planning area during the planning process. This inventory includes projects throughout the entire DPR planning area, including subwatersheds with previously approved watershed-based plans. Figure 7-1 through Figure 7-3 show selected site-specific BMPs identified in the watershed during the April 2017 DPR planning area windshield survey. Estimates also do not account for load reductions from programmatic, education and outreach, and policy and regulatory actions since direct impacts are not easily determined at this stage of the planning process.

Based on the review of reduction estimates, project/site-specific and basin-wide site-specific actions identified in the watershed-based plan are effective for addressing water quality problems and impairments in the watershed such as sediment, nitrogen, and phosphorus. Those actions are moderately effective in addressing bacteria and chloride, and programmatic and regulatory actions will be more effective at addressing these pollutants throughout the watershed. Due to the proportion of pollutant loading that originates from point sources, alignment and coordination with the WWTPs will also be critical for addressing chloride, nitrogen, and phosphorus loading.

Table 7-3: Annual Load Reductions from Previous Watershed Plans

SUBWATERSHED	NITROGEN	PHOSPHORUS	CHLORIDE	BOD	COD	SEDIMENT	BACTERIA	LEAD	ZINC
	LBS/YR	LBS/YR	LBS/YR	LBS/YR	LBS/YR	TONS/YR	CFU/YR (10^6)	LBS/YR	LBS/YR
Buffalo Creek	10,989	3,980	N/A	24,555	N/A	6,315	N/A	N/A	N/A
Indian Creek	18,037	N/A	N/A	86,578	549,206	3,949	N/A	1,606	1,770
Bull Creek-Bulls Brook	5,723	1,531	N/A	31,004	107,244	1,147	N/A	453	590
Mill Creek	N/A	7,930	141,383	N/A	N/A	5,717	6,783	N/A	N/A
North Mill Creek /Dutch Gap	101,175	89,357	319,186	N/A	N/A	N/A	22,998	N/A	N/A
GRAND TOTAL	**135,923**	**102,798**	**460,569**	**142,137**	**656,450**	**17,128**	**29,781**	**2,059**	**2,361**

Figure 7-2: Proposed wetland restoration/creation

Figure 7-3: Proposed field border and grade control

Table 7-4: Estimated Annual Basin-Wide BMP Load Reductions

BMP	QUANTITY (area / number / length)	NITROGEN REDUCTION (lbs/yr)	PHOSPHORUS REDUCTION (lbs/yr)	CHLORIDE REDUCTION (lbs/yr)	SEDIMENT REDUCTION (tons/yr)	BACTERIA REDUCTION (BILLION CFU/YR)
Basin-Wide Site-Specific BMPs - Total area benefited: 83,616 acres						
Cover Crops[1]	18,360 ac	72,612	2,959	0	5,958	6,782
Runoff Volume Reduction[2]	24,447 ac	52,771	4,894	2,339,500	1,749	32,321
Livestock Feed Area Basin/System[3]	68 ac / 81	1,996	151	33.6	11.4	971
No-Till / Strip-Till[1]	9,783 ac	15,667	3,203	0	8,320	2,277
Nutrient Management Plan	18,360 ac	36,306	6,905	0	0	0
Pasture Enhancement[4]	135 ac / 103	887	72	53.4	11	568
Road Salt Management	10,790 ac	0	0	4,104,866	0	0
Wetland Creation/Restoration	1,673 ac / 503	9,281	439	80,285	132	1,145
Basin-Wide BMP Total		**189,520**	**18,623**	**6,524,738**	**16,181**	**44,064**

[1] based on one year. [2] for undetained areas and could include any type or detention/retention practice. [3] these basins/systems address livestock capacity in comparison to the available pasture are observed. [4] Includes a combination of practices assumes some fencing, grass planting, a watering system, and a diversion. [5] Refers to a rock chute structure. [6] Loading and load reduction estimates for streambank and lake shoreline erosion are based on the Region 5 EPA's spreadsheet tool for "estimating pollutant load reductions for nonpoint source pollution control BMPs." All default values found in this spreadsheet tool are utilized for calculating estimates. [7] includes stream riffles for grade control and instream habitat enhancement; number calculated at 7 times bankfull width.

Table 7-5: Estimated Annual Site-Specific BMP Load Reductions – New BMPs

BMP	QUANTITY (AREA / NUMBER / LENGTH)	NITROGEN REDUCTION (LBS/YR)	PHOSPHORUS REDUCTION (LBS/YR)	CHLORIDE REDUCTION (LBS/YR)	SEDIMENT REDUCTION (TONS/YR)	BACTERIA REDUCTION (BILLION CFU/YR)
Site-Specific BMPs - Total area benefited: 38,389 acres / 295,892 ft						
Bioswale	0.23 ac / 170 ft / 1	6	1.4	1,808	0.68	3
Detention Basin, Urban	4 /1.5 ac	338	27	20,738	11	157
Field Border	43 / 61 ac / 75,032 ft	3,582	200	1,389	410	391
Filter Strip	10 /16 ac / 16,041 ft	789	46	522	64	119
Grade Control[5]	2	65	16	217	21	7.8
Grass Conversion	4 / 34 ac	431	16	112	29	11
Sediment Forebay	3 / 900 ft	8,422	430	274,241	221	3,448
Lake Shoreline Stabilization[6]	11,157 ft	171	86	0	86	0
Porous Pavement	1 / 1.2 ac	5	0.24	747	0.13	0.62
Pond[7]	4	930	127	12,244	214	228
Rain Barrel/Garden	510 barrels / 250 gardens	282	18	15,152	5	131
Stream Buffer	75 ac / 78,336 ft	1,400	77	13,324	44	440
Streambank Stabilization[6,7]	75,086 ft / 330 riffles	3,279	1,639	0	1,639	0
WASCOB	31	318	107	958	122	19
Waterway	31 / 50 ac/ 40,070 ft	5,963	960	12,466	1,246	642
Wetland Creation/Restoration	132 / 1,288 ac	62,363	2,406	918,951	2,336	17,386
Site-Specific BMP Total Reductions		**88,345**	**6,157**	**1,272,869**	**6,449**	**22,983**
Stakeholder BMPs - Total area benefited: 1,536 acres/ 33,026 ft						
Filter Strip/Riparian Buffer	28 ac / 21,056 ft	641	41	7,078	71	185
Stormwater Management BMP	1	1,644	86	57,864	40	947
Lake Shoreline Stabilization[6]	4,351 ft	3.7	1.9	0	1.9	0
Streambank Stabilization[6]	7,619 ft	402	201	0	201	0
Stakeholder BMP Total Reductions		**2,691**	**330**	**64,942**	**314**	**1,132**
TOTAL REDUCTION ESTIMATES		**91,036**	**6,487**	**1,337,811**	**6,763**	**24,115**

[1] based on one year. [2] for undetained areas and could include any type or detention/retention practice. [3] these basins/systems address livestock capacity in comparison to the available pasture are observed. [4] Includes a combination of practices assumes some fencing, grass planting, a watering system, and a diversion. [5] Refers to a rock chute structure. [6] Loading and load reduction estimates for

streambank and lake shoreline erosion are based on the Region 5 EPA's spreadsheet tool for "estimating pollutant load reductions for nonpoint source pollution control BMPs." All default values found in this spreadsheet tool are utilized for calculating estimates. [7] includes stream riffles for grade control and instream habitat enhancement; number calculated at 7 times bankfull width.

7.1.1.1 Load Reductions by Subwatershed

Load reduction estimates for nonpoint source pollutants are totaled by subwatershed as shown in Table 7-6 with bold indicating the top three highest total reductions per pollutant. Estimates indicate that the highest total nitrogen reductions can be achieved in the North Mill/Dutch Gap, Indian Creek, and Upper Des Plaines subwatersheds. The greatest phosphorus and sediment reductions can be realized in the North Mill/Dutch Gap, Mill Creek, and Upper Des Plaines subwatersheds. Efforts to address chloride and bacteria in the Buffalo Creek, Indian Creek, and Upper Des Plaines subwatersheds are likely to result in the greatest cumulative reductions.

Table 7-6: Estimated Load Reductions by Subwatershed

SUBWATERSHED	ACRES BENEFITED	NITROGEN REDUCTION (LBS/YR)	PHOSPHORUS REDUCTION (LBS/YR)	CHLORIDE LOAD REDUCTION (LBS/YR)	SEDIMENT REDUCTION (TONS/YR)	BACTERIA REDUCTION (CFU/YR 10^6)
Aptakisic Creek	3,315	6,187	287	393,278	141	1,720
Buffalo Creek	12,135	22,465	1,698	1,635,368	812	11,097
Bull Creek	13,787	24,532	1,717	456,935	1,925	7,214
Bull's Brook	738	1,672	155	2,188	176	221
Dutch Gap Canal/North Mill Creek	28,063	84,077	7,930	586,431	8,897	9,599
Indian Creek	21,370	37,284	2,490	1,643,950	1,743	14,426
Lower Des Plaines River	5,932	10,042	1,377	661,286	968	4,365
Mill Creek	16,108	34,469	3,309	1,050,887	2,909	6,250
Newport Drainage Ditch	4,753	13,344	1,466	142,850	1,418	2,195
Upper Des Plaines River	20,243	45,101	4,603	1,278,976	3,997	10,656

7.1.1.2 Load Reduction Targets

Water quality targets were established based on review of the Des Plaines River/Higgins Creek TMDL report, coordination between DPR planning area stakeholders. After a review process, it was decided that the two watershed TMDLs from within the DPR planning area (Buffalo Creek and Higgins Creek) would be used as guidance for chloride, phosphorus, and fecal coliform. The Illinois Nutrient Loss Reduction Strategy (INLRS) would be adopted for sediment, nitrogen, and phosphorus. Pollutant load reduction targets for nitrogen, phosphorus, sediment, chlorides and bacteria are shown in Table 7-7.

Table 7-7: Nonpoint and Point Source Load Reduction Targets

POLLUTANT	REDUCTION TARGET (%)	NOTES
Nitrogen	45%	Based on the INLRS
Phosphorus (lbs/yr)	50%, except for lakes with a phosphorus TMDL, where the TMDL targets apply.	Based on TMDL estimates and the INLRS. See Section 3.16.2 for TMDL load reduction targets for specific lakes.
Sediment (tons/yr)	45%	Based on INLRS target for phosphorus, and given the low sediment load in the watershed is considered an attainable target
Chloride (lbs/yr)	50%, except for Buffalo Creek, where the TMDL target applies	Target represents a range for streams modeled in the Buffalo Creek and Higgins Creek TMDL and is consistent with TMDL recommendations. See Section 3.16.2 for TMDL load reduction targets for Buffalo Creek.
Bacteria (billion CFU)	65% planning area-wide; except for Sylvan Lake and Buffalo Creek, where TMDL targets apply.	The fecal coliform target is based on the Buffalo Creek TMDL and represents an average of the modeled reductions over a range of flows; a reduction target of 65% was selected which accounts for seasonal variability. See Section3.16.2 for TMDL load reduction targets for Sylvan lake and Buffalo Creek.

Comparing the nonpoint and point source load reduction estimates to the total modelled pollutant loads suggests that moderate reductions may result from BMP implementation. Table 7-8 shows the breakdown of estimated nonpoint and point source pollutant loads in comparison to the total pollutant loads. Figure 7-4 is a series of charts showing the difference in nonpoint and point source contributions to the total estimated pollutant loads. Table 7-9 shows the estimated percent reductions in nonpoint source pollutant loads that can be achieved through BMP implementation. The key points to consider are:

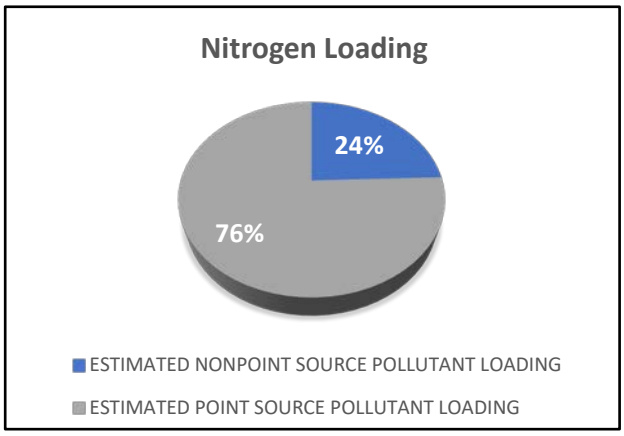
1. Project/site-specific and basin-wide site-specific actions are most effective at addressing sediment. Focusing on wide-spread adoption of cover crops and agricultural BMPs, such as field borders and grassed waterways, as well as streambank stabilization, will help address sediment loading and exceed the target reduction.
2. Project/site-specific and basin-wide site-specific actions are nominally effective in addressing nitrogen, phosphorus, and chloride. These practices do not address point sources, which are estimated to contribute 76% of the total nitrogen, 74% of the total phosphorus, and 41% of the chloride loads in the DPR planning area. Load reduction targets can only be achieved by reducing contributions from point sources. It is important to note that through new, lower permit limits, point sources within the DPR planning area are moving towards substantial reductions in phosphorus in the coming years.
3. Programmatic and regulatory actions may better address chloride by greatly reducing application rates. BMPs typically have poor chloride removal efficiencies because chloride is dissolved in the water. Furthermore, the cost of implementing BMPs to address chloride throughout dense urban areas (primary source) is high.
4. Watershed-wide detention practices, wetland restoration, streambank stabilization, and agricultural BMPs, especially wide-spread adoption of no-till/strip-till, cover crops, and nutrient management, can reduce a relatively large percentage of the nonpoint source component of phosphorus and nitrogen loading.

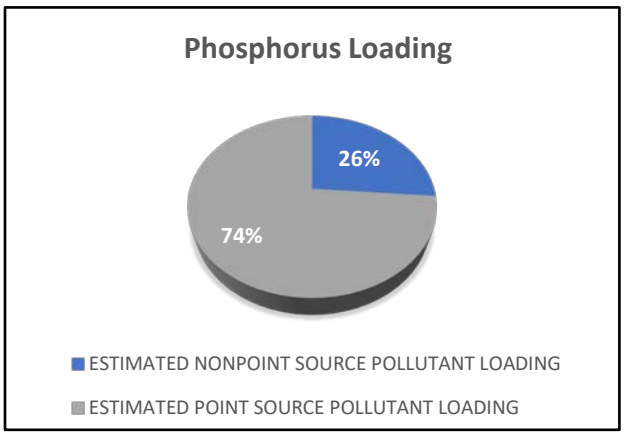
5. Project/site-specific and basin-wide site-specific actions are moderately effective in addressing nonpoint source bacteria and must be focused at addressing the major urban area sources. Watershed-wide adoption of urban detention practices are necessary to achieve more noticeable reductions in bacteria. Point source data for bacteria was not available; it is believed that notable reductions could be achieved by addressing these sources.

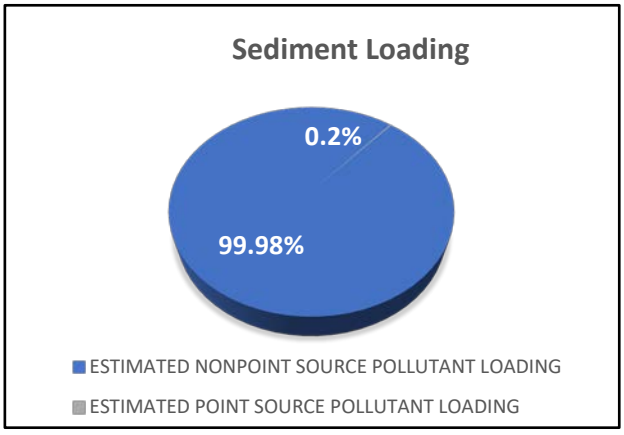
Table 7-8: DPR Planning Area Estimated Pollutant Loading (Nonpoint & Point Sources)

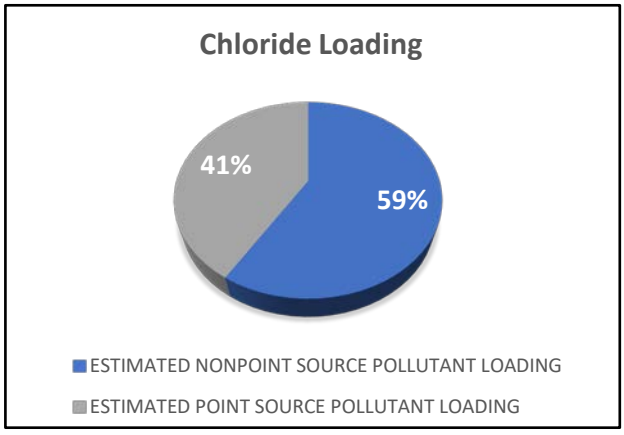
POLLUTANT	ESTIMATED NONPOINT SOURCE POLLUTANT LOADING[1]	ESTIMATED POINT SOURCE POLLUTANT LOADING	TOTAL POLLUTANT LOADING
Nitrogen (lbs/yr)	1,010,091	3,123,802	**4,133,893**
Phosphorus (lbs/yr)	60,323	169,000	**229,323**
Sediment (tons/yr)	37,460	67.29	**37,527**
Chloride (lbs/yr)	51,873,595	36,383,729	**88,257,324**
Bacteria (billion CFU)	258,786	NA	**258,786**

[1] – Nonpoint source loading totals includes stream and lake bank erosion, gully erosion and failing septic systems









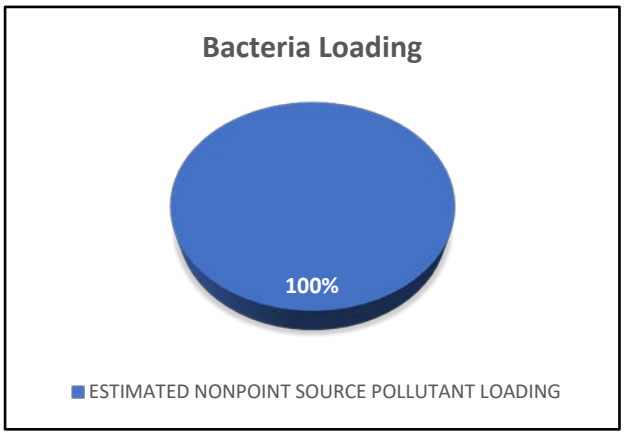


Figure 7-4: Nonpoint and Point Source Pollutant Contributions

Table 7-9: Estimated Nonpoint Source (NPS) Pollutant Load Reductions from BMPs

POLLUTANT	TOTAL ESTIMATED NPS POLLUTANT LOADING	ESTIMATED SITE-SPECIFIC BMP ANNUAL NPS POLLUTANT LOAD REDUCTIONS (%)	ESTIMATED BASIN-WIDE BMP ANNUAL NPS POLLUTANT LOAD REDUCTIONS (%)	ESTIMATED ANNUAL NPS LOAD REDUCTIONS (%)
Nitrogen (lbs/yr)	1,010,091	91,036 (9%)	189,520 (19%)	280,556 (28%)
Phosphorus (lbs/yr)	60,323	6,487 (11%)	18,623 (31%)	25,110 (42%)
Sediment (tons/yr)	37,460	6,763 (18%)	16,181 (43%)	22,944 (61%)
Chloride (lbs/yr)	51,873,595	1,337,811 (3%)	6,524,738 (13%)	7,862,549 (15%)
Bacteria (billion CFU)	258,786	24,115 (9%)	44,064 (17%)	68,179 (26%)

7.2 COST ESTIMATES

Actions recommended in this plan will be implemented by numerous lead and supporting partners (as indicated in Chapter 6 and Appendix N), and therefore the estimated costs of plan implementation are spread across various watershed stakeholders. Furthermore, the menu of projects identified is inclusive, so that the plan identifies as many potential projects as possible. The summary of cost estimates that follows is intended to provide a general idea of the scope of all projects considered in the plan but is not to be construed as a single "project cost" to be borne by a lone watershed entity. Table 7-10 summarizes the estimated funding required for the site-specific actions identified in the action plan (Chapter 6). The identified site-specific actions represent the main projects that are recommended for implementation. Table 7-11 summarizes the estimated funding required for the basin-wide site-specific actions identified in the action plan. The identified basin-wide site-specific actions represent all the projects that are needed to meet the full potential of non-point source pollution reduction in the planning area. The cost estimates are for direct implementation projects and not the

administrative, project management, and watershed coordinator costs. For all BMPs, an additional 20% should be considered to account for engineering/permitting and annual maintenance.

Cost estimates are generated from a combination of technical experience, previous subwatershed plans, and the USDA's average practice cost list. Cost estimates are generalized for watershed-scale planning purposes and these estimates should not be used to calculate costs for individual projects, as costs may range significantly depending on site conditions. Appendix K includes criteria and assumptions used to develop the cost estimates listed In Table 7-9. Potential funding sources are included in Appendix L.

Table 7-10: Cost Estimates for Site-Specific Action Recommendations

TYPE	# OF PROJECTS/ACTIONS	ACRES BENEFITED / ACRES PRACTICE	UNIT COST	ESTIMATED TOTAL COST
Filter Strips/ Riparian Buffers / Field Border /Grass Conversion	255	2,276/217	$4,000/ac	$868,664
WASCOB	8 / 31 basins	70	$4,000/basin	$124,000
Grassed Waterways	31	1,098/50	$8,000/ac	$400,000
Bioswale	1	6.8/0.23	$15/sq-ft	$150,282
Streambank Stabilization	82,705 ft / 330 riffles	N/A	$300/ft / $35,000/riffle	$32,834,536 - $41,084,536
Lake Shore Stabilization	15,312 ft	N/A	$100/ft	$1,550,833
Sediment Forebay	3 / 900 ft	3,876	$1,560/ft	$1,404,000
Grade Control Structure	2	44	$8,000/structure	$16,000
Hydrologic/Hydraulic Impediments	1,547	N/A	$10,000 - $80,000/site	$15,470,000 - $123,760,000
Problem Discharge Locations	204	N/A	$5,000 - $30,000/site	$1,020,000 - $6,120,000
Detention Basin Retrofits	658	N/A	$5,000 - $50,000/site	$3,030,000 - $30,300,000
Wetland Creation/Restoration	131	49,734/1,300	$80,000/ac	$103,998,098
Stormwater BMPs	10	450/2	Variable	$2,393,064
Lake Actions	*447*	*N/A*	*Variable*	*$7,463,767 - $15,241,470*
TOTAL				**$170,723,244 - $327,410,947**

Note: Lake Actions are a mixture of both site-specific and basin-wide site-specific action plan recommendations. For more information on lake action recommendations see Chapter 6, Section 6.3.7.

Table 7-11: Summary of Cost of Recommended Basin-Wide Site-Specific Actions by Priority

Type	Estimated Cost			
	High Priority	Medium Priority	Low Priority	Total
Cover Crops (CC)	$440,042	$660,453	$41	$1,100,536
Runoff Volume Reduction (RVR)	$156,781,260	$200,628,932	$0	$357,410,192
Nutrient Management (NU)	$0	$366,822	$0	$366,822
No-Till /Strip-Till (TIL)	$342,011	$75	$33	$342,118
Pasture Enhancement (PE)	$0	$4,079,775	$42,239	$4,122,014
Feed Area Management (FAM)	$4,068,535	$0	$0	$4,068,535
Wetland Creation/Restoration (WLR)	$128,613,837	$0	$0	$128,613,837
Wetland Enhancement (WLE)	$36,499,279	$0	$0	$36,499,279
Total	**$326,744,964**	**$205,736,057**	**$42,313**	**$532,523,333**

Where readily available, costs were tabulated from previously completed watershed-based plans and are presented in Table 7-12. Although there is some overlap with action items, it is reasonable to assume that those estimates from other watershed-based plans are in addition to those presented above. Using estimates from the current and past watershed-based plans, the total cost among all stakeholders to implement all site-specific action recommendations would be approximately $265-$422 million. When basin-wide site-specific BMPs are included, the cost estimate for all possible nonpoint source reduction projects totals nearly $954 million. It is important to consider that there are many complimentary benefits in addition to water quality improvements that are not necessarily quantified in this estimate. When evaluating implementation strategies, it is important to consider the benefits such as green infrastructure enhancement, improved habitat, increased recreational value, and reduced flooding issues.

Table 7-12: Cost Estimates from Previous Plans (if available)

SUBWATERSHED PLAN	TOTAL COST ESTIMATE
Buffalo Creek	$15,269,165
Mill Creek	$49,226,882
North Mill Creek/Dutch Gap Canal	$29,646,365
GRAND TOTAL	**$94,142,412**

7.3 NEXT STEPS FOR PLAN IMPLEMENTATION

Often, the greatest challenge of any watershed management process is its coordinated implementation. Successful implementation requires widespread coordination, effective partnerships and support, local leadership, financial and technical resources, time, and a genuine willingness to translate planning to action on-the-ground. The DPR planning area includes many implementation partners and supporters that will have to coordinate efforts to implement the recommendations in the action plan. No single partner has the financial or technical resources to accomplish the plan goals and objectives; partners working together are necessary to achieve meaningful results. Responsible entities are defined as jurisdictions; these entities have primary responsibility over actions or practices within their boundaries. Jurisdictions include municipalities, townships, counties, forest preserve districts, and the State of Illinois. Supporting partners are described in Section 6.1 Implementation Partners. Responsible entities or lead jurisdictions as well as supporting partners are further detailed in the individual action item tables located in Appendix N.

Combining and coordinating resources, funding, effort, and leadership will be the most efficient and effective means of maintaining watershed health. Implementation of this plan will also require the development of partnerships with local, state, and federal organizations for implementation, technical assistance, and funding. These efforts require the investment of a significant amount of time and resources.

Table 7-13 below shows five immediate, year-one priorities. The following subsections describe the key components of successful and sustainable plan implementation.

Table 7-13: Year One Plan Implementation Priorities

RECOMMENDED ACTION/PRIORITY
1. Working with DRWW, the Bull Creek-Bull's Brook Watershed Council, Buffalo Creek Clean Water Partnership, and other active subwatershed groups, determine specific year-1 implementation actions; coordinate with DRWW on short term monitoring priorities.
2. Research funding and technical assistance to implement recommendations identified in the action plan.
3. Submit grant applications, if applicable, and secure additional funding sources for plan implementation.
4. Coordinate available programs, policy changes, and other local initiatives and programs where private landowners are responsible for participation or implementation.
5. Promote and adopt the plan; prioritize and incorporate plan recommendations into existing programs, activities, and budgets.

7.3.1 PLAN ADOPTION

Support of the goals, objectives and recommendations of the Des Plaines River Watershed-Based plan should be formalized through its adoption by primary implementation entities (jurisdictions) and lead and support partners. Jurisdictions should adopt the watershed-based plan so that there is a basis for the incorporation of plan recommendations into the operations and procedures of the organization and its pursuit of project funding and implementation relevant to the DPR planning area. Chapter 6 outlines the DPR planning area

jurisdictions and lead and support partners responsible for implementing the action recommendations of the watershed-based plan.

7.3.2 Support and Maintain Exiting Watershed Planning Committee(s)

One important step for plan implementation will be continued support for existing watershed organizations to lead, organize, and coordinate plan actions. A planning group was established for the DPR planning area as a whole and is made up of representatives from other subwatersheds where locally active groups are implementing previous plan recommendations (watershed planning committee). Responsibilities of the committee(s) include administration, coordination of stakeholders to support individual watershed projects, and working with regulatory partners on recommended policies and programs.

Throughout the watershed planning process, the existing watershed planning committee has provided valuable input regarding issues, resources, priorities, and actions. The committee can continue to hold regular meetings, take a lead in facilitating plan recommendations, organize watershed field trips, host educational workshops and forums, and bring watershed stakeholders and multiple units of government together to discuss issues and opportunities. The supporting partners can consider whether staff positions are needed or merging with the existing collaborative organizations and/or subwatershed committees would be beneficial in the future. The watershed planning committee is encouraged to generate stakeholder interest and involvement with implementation. As projects are initiated, the positive environmental, aesthetic, and community benefits will lead to additional participation.

7.3.3 Stakeholder Participation and Engagement

There are tangible benefits to stakeholder participation in watershed activities, from positive media attention to improved quality of life for residents. Increased involvement also can yield and leverage significant local, state, and federal funding opportunities to help share the cost of project implementation. Some actions can be added to existing capital improvement and maintenance plans, budgets, and schedules. This is a fairly quick and easy approach to implementing recommendations within the purview of specific jurisdictions. In other cases, an action recommendation will require the involvement of multiple stakeholders, such as residents, a municipality, and a county, state, or federal agency to provide financial and technical support. Some actions require cross-jurisdictional coordination for issues; for example, establishing a green infrastructure corridor along a stream channel, or natural area preservation and restoration often require interjurisdictional cooperation and may require a longer time frame for implementation. Other actions will require the cooperation of individual or groups of landowners, whether they are residents, homeowners' associations, businesses, or institutions.

7.3.4 Identify Implementation Champions

Implementation actions require a leader or a single champion for the project, to organize resources and keep the project(s) moving forward. This champion may be the watershed organization, or a single entity such as a landowner, a subwatershed group, or a municipality. In some cases, actions recommend the adoption of new policies, plans, or standards that modify the form, intensity, or type of development or redevelopment in the watershed in a way that better protects resources. These actions will require some effort on the part of

municipalities to understand how plans and policies can be modified and to discuss and adopt new, or modify existing, policies, plans, and standards.

7.3.5 Resources and Funding

Funding implementation and watershed coordination actions is a priority. Securing sources of funding engages contract-level accountability and performance requirements that stakeholders are often more responsive to. There are numerous sources of funds available to help support projects or provide cost-share to match other sources of funds. A list of numerous local, regional, state, and federal funding sources is identified in Appendix L. Most of the programs require a local match of funds or in-kind services. Although these funding sources can provide a good source of revenue, significant local investment of time and money will be required to move this plan forward. These soft costs must be evaluated and incorporated into the operating strategies of the individual partners.

Many federal, state, local, and private programs are available. There are numerous sources of funding available to support projects or provide cost-share to match other sources of funds. Appendix L outlines the most common and available potential sources of funding for the technical assistance and actions identified in the plan; most BMPs recommended **are** eligible for some form of funding. Information regarding potential funding sources is readily available online and applicants should research available programs ahead of time to understand the funding cycles, conditions, and terms. Most grant programs require financial or labor match, thus applications that leverage multiple sources also have the highest probability of being successful.

7.3.6 Implementation Partners

Parties who are key potential partners whose support will lead to the realization of identified goals for the DPR planning area are listed in Chapter 6 and in the detailed action plan tables in Appendix N as implementation partners. These organizations are listed as such because they are expected to fulfill one or more of the following functions:

- Oversee or implement watershed protection, restoration, and remediation strategies
- Acquire funding for watershed plan implementation
- Organize or participate in data collection
- Provide regulatory or technical guidance and issue permits
- Monitor the success of the watershed plan
- Acquire land for green infrastructure restoration or protection purposes
- Develop education strategies

Because implementation of the watershed-based plan will largely rest with local units of government, it is critical that they be involved from the beginning. They usually have the most to gain by participating and the most up-to-date information on the structure, needs, and available resources of the community. In addition, some of the most powerful tools for implementation, such as planning, controlling development standards, and zoning reside at the local, jurisdictional level.

7.4 EVALUATING PLAN PERFORMANCE

An important component of any watershed planning initiative is the ability to monitor performance towards goals and objectives. This section focuses on the administrative-based monitoring that tracks the activities of stakeholders and the range of actions that are implemented. Section 7.5 discusses direct monitoring of quantitative criteria such as water quality and aquatic health that indicate the effectiveness of implementation actions.

7.4.1 EVALUATING PLAN IMPLEMENTATION PERFORMANCE

It is necessary to monitor the progress towards achieving the seven goals of this watershed-based plan outlined in Chapter 2. Tracking progress relevant to these is as simple as an organized system in each jurisdiction to keep track of what is happening in their portion of the watershed. Communicating and reporting progress towards goals is equally as important as tracking them in the first place.

The following recommendations are included to help track progress and achieve the goals with plan implementation.

- In the early stages of the plan implementation process, stakeholders should establish a sustainable and active watershed committee that will meet at least quarterly to discuss activities and progress towards goals. A list of completed actions, proposed, and in-progress actions should be tracked for each jurisdiction.
- The plan should be evaluated every five years to assess the progress made as well as to revise the plan, if appropriate, based on the progress achieved. The plan should also have a comprehensive review and update after 10-years (section 7.7). Amendments and changes may be made more frequently as laws change or new information becomes available that will assist in providing a better outlook for the watershed. As goals are accomplished and additional information is gathered, efforts may need to be shifted to issues of higher priority.
- The watershed planning committee should request each major jurisdiction and project partner in the watershed to provide an annual update, which could be in the form of a scorecard that tracks progress towards goal objectives via measurable milestones. The scorecard system is presented in section 7.4.2 and Appendix M. It is an easy and effective way to compile and track progress in a measurable way and evaluate the effectiveness of achieving short, medium, and long-term goals. Scorecards are an effective way to identify what needs attention and what stakeholders should focus on in the next year.
- Other opportunities for evaluating the status of plan implementation include the completion of quarterly project reports or group meeting minutes. Since this plan is a flexible tool, changes/modifications are anticipated based on usability and changes in priority throughout implementation.

7.4.2 MEASUREABLE MILESTONES AND SCORECARD SYSTEM

Interim measurable milestones are directly tied to the DPR planning area performance indicators. Milestones are essential when determining if management measures are being implemented and how effective they are

at achieving plan goals and objectives over given time periods. This allows for periodic plan updates and changes that can be made if milestones are not being met.

Watersheds are complex systems with varying degrees of interaction and interconnection between physical, chemical, biological, hydrological, habitat, and social characteristics. Indicators that reflect these characteristics may be used as a measure of watershed health. Goals and objectives in the plan determine which indicators should be monitored to assess success. Physical indicators could include amount of sediment entering a steam reach or presence or lack of adequate stream buffers, whereas chemical and biological indicators could include nitrogen loads or macroinvertebrate health. Social indicators can be measured using demographic data or, for example, the number of landowners adopting conservation practices.

DPR planning area scorecards were developed for each of the watershed-based plan goals and are located in Appendix M. Table 7-14 provides an example indicator and associated milestones for each goal as taken from the complete scorecards in Appendix M.

Table 7-14: Example Indicators and Milestones for Each Goal

GOAL	EXAMPLE INDICATOR	SHORT TERM MILESTONE (1-5 YRS)	MEDIUM TERM MILESTONE (6-10 YRS)	LONG TERM MILESTONE (10+ YRS)
1. Water Quality Improvements	Number of waterbodies removed from the Illinois EPA's impaired list.	2 lakes / 1 stream segment	6 Lakes / 3 stream segments	30 Lakes / 6 steam segments
2. Regional Green Infrastructure & Natural Resources	Area of degraded natural communities restored.	1,000 acres	5,000 acres	10,000 acres
3. Flood Damage Reduction	Percentage of structures with flood insurance in the 100-year floodplain.	25%	50%	100%
4. Funding, Installing, and Maintaining Stormwater Infrastructure	Number of cost-sharing programs.	10	20	50
5. Community and Agency Coordination	Number of municipalities, counties, and natural resource agencies that adopt the Des Plaines River Watershed-Based Plan.	25 Agencies	All Agencies	All Agencies
6. Sustainable Agricultural Systems	Number and area of agricultural BMPs installed.	25 BMPs treating greater than 2,500 acres	50 BMPs treating greater than 2,500 acres	100 BMPs treating greater than 5,000 acres
7. Education and Outreach	Number of people reached by outreach campaign.	Establish outreach campaign	5,000	10,000

This scorecard system should serve as an organizational monitoring plan and a tool for tracking progress toward meeting plan goals and specific recommendations and action items. Realistic short, medium, and long-term milestones are included for each indicator in the scorecards (Table 7-14). Each milestone is a specific action recommendation and is intended to fulfill plan objectives if executed. Indicators are to be used as measurement tools when determining if each milestone has or has not been met. If the measurement of each

indicator becomes problematic, the watershed planning committee should revisit and make adjustments where needed. It is up to local stakeholders to determine the priority of each milestone based on their ability to follow through with them. Scorecard evaluation on an annual basis is an effective way to identify priorities and what stakeholders should focus on in the next planning year.

Milestones in the scorecards can be graded based on the following criteria: A = Met or exceeded milestone(s); B = Milestone(s) 75% achieved; C = Milestone(s) 50% achieved; D = Milestone(s) 25% achieved; F = Milestone(s) not achieved

7.4.3 Plan Implementation Schedule

Implementing actions should occur immediately where specific projects and willing stakeholders have been identified. A general implementation schedule is presented in Table 7-15. More detailed timeframes are included in Appendix N for each site-specific action.

Table 7-15: General Implementation Schedule

TASK	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
Promote and adopt the plan	X									
Determine specific year-1-5 implementation actions; coordinate with DRWW on short term monitoring priorities.	X	X								
Research funding and technical assistance to implement priority recommendations identified in the action plan.	X	X	X	X						
Submit grant applications if applicable and secure additional funding sources for plan implementation.	X	X	X	X	X	X	X	X		
Coordinate available programs, policy changes and other local initiatives and those programs where private landowners are responsible for signing up.	X	X	X	X	X	X	X	X	X	
Project planning, site surveys and project design and budget development		X	X	X	X	X	X	X	X	
Prioritize and incorporate plan recommendations into existing programs, activities, and budgets.	X	X	X	X	X	X	X	X	X	X
Implementation and construction of projects			X	X	X	X	X	X	X	X
Report and monitor progress	X	X	X	X	X	X	X	X	X	X
Communicate success stories		X	X	X	X	X	X	X	X	X
Evaluate accomplishments			X			X				X
Update Watershed-Based Plan										X

7.5 WATER QUALITY MONITORING STRATEGY

The need for water quality-monitoring has clearly been defined and communicated by stakeholders. As detailed in Chapter 3, the DRWW implemented a comprehensive watershed-wide monitoring program and quality assurance project plan with over seventy stations, and data collection started in September of 2015. The DRWW monitoring effort should be continued and financed to support further characterization of problems and to monitor conditions and health of the watershed through time. The DRWW monitoring will support a quantitative means to assess the effectiveness of plan implementation and the cumulative contribution towards goals and objectives.

Error! Reference source not found. shows the location of existing DRWW monitoring sites, Illinois EPA monitoring sites, USGS gage stations, and publicly-owned WWTPs. For more information about the monitoring strategy and monitoring locations view DRWW's website and monitoring strategy (http://www.drww.org/plans/reports). The DRWW water quality monitoring data has proven valuable throughout the planning process to characterize the watershed and prioritize actions. The feedback and recommendations summarized below are the result of analyzing and applying the DRWW monitoring data:

1. Environmental parameters that include some volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) or polycyclic aromatic hydrocarbons (PAHs), pesticides, and some metals are expensive analyses. A scientific and use case analysis of this data should be performed to determine what type of environmental monitoring should be continued. Perhaps collection of this data could be scaled back either by intensity, number of stations, or number of parameters. Indicator parameters could also be evaluated and considered.
2. Pairing DRWW monitoring data with USGS gage stations is important and the relevant stations should be maintained. Key DRWW stations that coincide with important USGS gages include 13-6, 10-4, 10-2 16-4, 16-1/16-2, 11-2, 13-1, and 17-2.
3. Data from stations downstream of wastewater treatment facilities should be used cautiously. Based on nutrient and chloride data reviewed, it is likely that the effluent and streamflow had not fully mixed. This resulted in elevated estimates of pollutant loading.
4. Installing staff gages at or near the DRWW monitoring sites should be considered and stage readings recorded during sampling events. This will allow flow to be attributed to sampling events in the future with a stage/discharge relationship.
5. From a watershed planning standpoint, the important parameters to continue monitoring are:
    a. Nitrogen, Kjeldahl, Total
    b. Nitrogen, Ammonia
    c. Nitrate, Total
    d. Nitrite, Total
    e. Phosphorus, Total
    f. Chloride, Total
    g. Total Suspended Solids
    h. E. Coli
    i. Total Dissolved Solids
    j. Conductivity
    k. pH
    l. Diel Dissolved Oxygen
    m. Temperature
    n. Total Organic Carbon (TOC)
    o. Fish Community, Fish Index of Biotic Integrity (fIBI)
    p. Aquatic macroinvertebrate Community, Macroinvertebrate Index of Biotic Integrity (mIBI)

6. The total suspended solids data was limited for estimating sediment loading in the watershed, possibly due to the method of sample collection. Future monitoring at all sites or select sites should consider alternate sample collection methods to collect a more representative sample for estimating sediment yields.

Section 7.4 tracks progress through achievement of actions, while this section outlines a strategy to directly monitor the effectiveness of the actions from a water quality perspective. Table 7-16 summarizes the proposed monitoring categories and associated recommendations. Given the current DRWW monitoring program, this section emphasizes lake and volunteer monitoring.

Table 7-16: Summary of Monitoring Categories and Recommendations

MONITORING CATEGORY	SUMMARY OF RECOMMENDATIONS
Streamflow	USGS and the DRWW maintain functioning gages in watershed; baseline hydrographs have been developed. Continue DRWW streamflow measurements.
Ambient water quality (streams)	Support and utilize current and future DRWW monitoring efforts.
Physical and biologic assessment (streams)	Support and utilize current and future DRWW monitoring efforts.
BMP effectiveness	Monitoring BMP effectiveness of specific practices or clusters of practices; coordinate with DRWW.
RiverWatch program	Partner with National Great Rivers Research and Education Center (NGRREC) to enhance the volunteer monitoring program in the watershed.
LCHD Lake monitoring	• Incorporate quantifiable and spatial monitoring of aquatic invasive species in lakes. • Incorporate monitoring for algal toxins. • Sample and assess all lakes in the watershed in the same year and on the same schedule. • Collect storm-event water quality samples from all lake inlets as part of program; install staff gages. • Conduct a lake nutrient balance assessment and evaluate available phosphorus in lake sediment. • Incorporate additional parameters into lake shoreline assessments to better quantify sediment and nutrient loads; this includes eroding bank height and estimated lateral recession rates. Collect lake bank soil cores to determine soil nutrient concentrations.
Illinois Volunteer Lake Monitoring Program (VLMP)	
Continuous watershed model	Develop a continuous flow and water quality model for the watershed to effectively evaluate future land use changes and climate change impacts on water balance and water quality for streams and lakes.
Storm event runoff monitoring	Support and utilize current and future DRWW monitoring efforts.

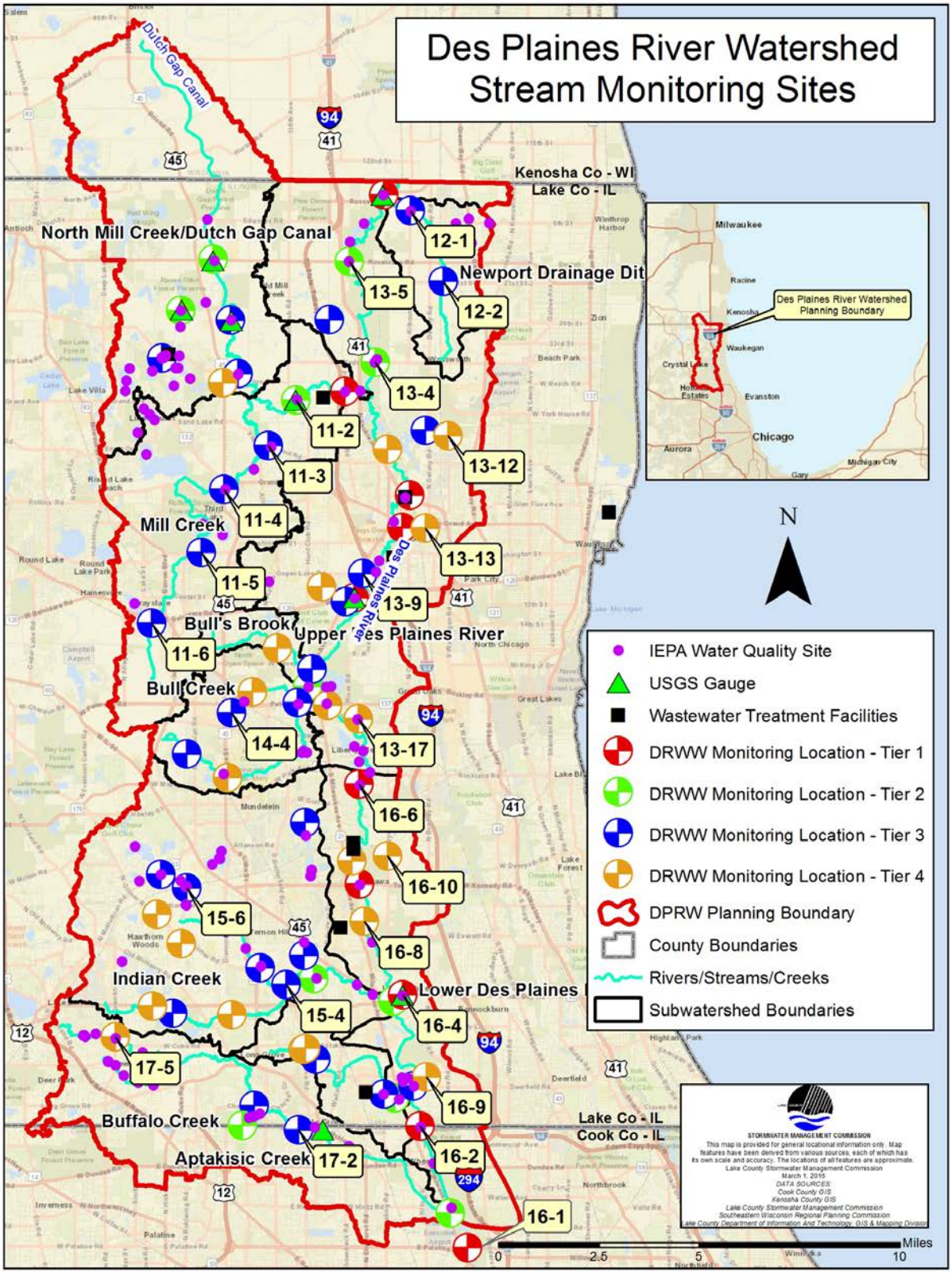


Figure 7-5: Existing DRWW Monitoring, USGS Gage, and WWTP Sites

7.5.1 BMP Effectiveness Monitoring

As funding allows, BMP effectiveness monitoring should be performed on projects to assess if actions are achieving the watershed-based plan goals and objectives. It is recommended to incorporate monitoring into the budget of BMP projects. Monitoring should be conducted by environmental consultants or independent agency staff experienced in sampling and monitoring methods.

Monitoring can be used to determine the overall effectiveness of individual or multiple spatially clustered BMPs on achieving the watershed-based plan goals. It is usually necessary to collect and analyze water quality and perform bioassessment sampling if the BMP is directly addressing a stream reach. This can be accomplished by monitoring prior to the practice (inflow) and downstream of the practice (outflow) or monitoring baseline and post-implementation conditions. It is also important to monitor the hydraulic performance and channel changes. Urbanized areas typically increase the total volume and rate of stormwater runoff that enters receiving streams and storm sewer systems. This causes changes in both hydrology and morphology. A goal of BMPs is usually to attenuate these flows and morphological impacts.

Table 7-17 includes minimum parameters that can be used as guidelines in designing and evaluating a monitoring program to evaluate BMP effectiveness. Benchmark indicators are based on water quality criteria and standards, the 2017 MBI report, or expert examination of water quality conditions to identify values representative of conditions that support designated uses and biological integrity and quality. The 2017 MBI Report and 2015 DRWW QAPP should also be referenced prior to initiating a monitoring program in order to maintain consistency.

Evaluation of the progress toward meeting targets indicates whether implemented BMPs are effective. If implemented BMPs are determined to be ineffective, the approach should be reconsidered or changed altogether.

Table 7-17: Baseline Water Quality Analysis Parameters

PARAMETERS	BENCHMARK INDICATORS
Total Phosphorus	0.05 mg/L for lakes (Illinois criteria) / 0.072 mg/L (regional reference non-effect benchmark; DRWW report)
Total Suspended Solids (TSS)	28 mg/L (regional reference non-effect benchmark; DRWW Report)
Total Dissolved Solids (TDS)	296 mg/L (regional reference non-effect benchmark; DRWW report)
Ammonia-N	15 mg/L (Illinois general use criteria)
Total Kjeldahl Nitrogen (TKN)	0.7 mg/L (regional reference non-effect benchmark; DRWW Report)
Nitrate-N	10 mg/L (Illinois drinking water standard)
Chloride	500 mg/L (Illinois criteria)
Fecal Coliform Bacteria	126 cfu/100 ml (US EPA geometric mean criteria; recreational use standard)
Dissolved Oxygen	No less than 5.0 mg/L (Illinois criteria)
Temperature	Less than 90° F (Illinois criteria)
pH	Between 6.5 – 9.0 (Illinois criteria)

PARAMETERS	BENCHMARK INDICATORS
Conductance, Specific	751 µS/cm (regional reference non-effect benchmark; DRWW report)
Flow	--
Fish	Fish Index of Biotic Integrity (fIBI) 41 or greater
Aquatic Macroinvertebrates	Macroinvertebrate Index of Biotic Integrity (mIBI) 41.8 or greater

7.5.2 RIVERWATCH VOLUNTEER PROGRAM

The National Great Rivers Research and Education Center (NGRREC) administers the RiverWatch program, which educates and trains volunteers to collect data from Illinois streams. The NGRREC holds open labs and workshops throughout the state to train volunteers. The RiverWatch program was previously called EcoWatch and was administered by the IDNR.

While the RiverWatch monitoring program collects basic information about macroinvertebrates and aquatic habitat, it provides a real opportunity to engage stakeholders and volunteers to actively participate in the watershed in a meaningful way. A continuous and consistent monitoring program under RiverWatch would be a valuable tool to supplement work being done by the DRWW, evaluate the evolving condition of the watershed, and monitor the effectiveness of watershed-based plan implementation. A RiverWatch program, however, should not be seen as a replacement for physical and biologic assessments performed by the DRWW.

It is recommended that the watershed planning committee work with the DRWW to select several designated RiverWatch stream reaches in the watershed. The reaches are typically 200-300 feet in length, depending on the type of macroinvertebrate habitat. The designated reaches should either be on public land or private lands with landowner permission. Stream reaches within Forest Preserve District property should be evaluated. The designated reaches should be communicated to the NGRREC so that volunteers in the area are focused to the designated stream reaches.

The watershed planning committee may want to consider a public relations program to educate the public regarding the RiverWatch program and enlist volunteers. Funding opportunities should be considered to reimburse travel expenses for volunteers to attend the necessary training provided by NGRREC.

7.5.3 LAKE MONITORING

There are numerous lakes in the DPR planning area that are characterized as part of Chapter 3. The lakes are a tremendous resource for recreation and watershed health and function. Lake monitoring should be considered a priority to maintain and manage the lake systems and their value as an ecological and recreational resource. Currently the Illinois EPA, LCHD, and Lake Associations administer lake monitoring programs in the DPR planning area. These programs should be supported and enhanced by the watershed stakeholders and implementation partners.

7.5.3.1 LCHD Lake Monitoring

The Lakes Management Unit (LMU) of the LCHD has been collecting water quality data on Lake County lakes since the late 1960s. Starting in 1999, approximately 32 lakes per year are monitored, equating to about a 5-year period between lake monitoring. Data collection includes temperature, dissolved oxygen, phosphorus, nitrogen, suspended solids, pH, alkalinity, conductivity, water clarity, plant community, and shoreline characteristics. Detailed reports are written for each lake and include data analyses, a list of problems specific to each lake, and recommendations on how to reduce or eliminate those problems. Reports are available online, although the information is not readily available in a database format. It is recommended that the watershed planning committee continue support of this existing lake monitoring program and track the results of each of the monitored lakes in the watershed to monitor the effectiveness of plan implementation.

7.5.3.2 Illinois Volunteer Lake Monitoring Program (VLMP)

The Illinois EPA established the VLMP program in 1981 to engage and educate the public about lake health and lake management while developing a means to collect data and observations about lakes throughout Illinois. The program funds volunteer training programs, technical and administrative support to volunteers, and laboratory analysis costs. As volunteers gain experience, they can graduate to higher tiers of data collection and lake assessment as shown in Table 7-18.

The LCHD LMU works directly with the Illinois EPA and the VLMP volunteers relative to Lake County. Not all lakes in the watershed have a volunteer commitment through the VLMP program. The VLMP program does not include quantity or spatial-based monitoring of aquatic invasive species, although the volunteers are free to provide narrative descriptions about aquatic invasive species.

Table 7-18: Monitoring Tiers of the Illinois VLMP

TIER LEVEL	DESCRIPTION OF VLMP MONITORING TIERS
Tier 1	Volunteers perform Secchi disk transparency monitoring and field observations only. Monitoring is conducted twice per month from May - October, typically at 3 in-lake sites. Field observations include the presence of invasive species including installation and monthly observations of zebra mussel plate installed near boat launch.
Tier 2	In addition to the tasks of Tier 1, volunteers collect water samples for nutrient and suspended solid analysis at the representative lake site (site 1). Water quality samples are taken only once per month, May - August, and October in conjunction with one Secchi transparency monitoring trip.
Tier 3	In addition to tasks of Tier 1 and 2, volunteers collect water samples at up to three sites on their lake. Their samples are analyzed for nutrients and suspended solids. They also collect and filter their own chlorophyll samples. Dissolved oxygen and temperature profiles may also be performed, depending on equipment availability. Data collected in Tier 3 is used in the category 5 Integrated Report and is subject for use in designating state impaired waters.

7.5.3.3 Lake Monitoring Recommendations

In addition to efforts currently being performed by individual Lake Associations, LCHD, and the Illinois VLMP, the following recommendations should be considered to enhance current monitoring activity that is performed on lakes, and should be considered at a minimum for all lakes 20 acres or greater, but should be applied to all other lakes as resources allow:

1. Incorporate quantifiable and spatial monitoring of aquatic invasive species in lakes.
2. Develop a rugged and long-lasting watershed-specific aquatic invasive species educational sign, if one doesn't currently exist, and install at all boat ramps.
3. Incorporate monitoring for algal toxins in lakes used for recreation.
4. Sample and assess all lakes within a five-year rotation (or shorter) and on the same schedule.
5. Per stakeholder input, collect storm-event water quality samples from all lake inlets as part of program; install staff gages.
6. Assess lake nutrient balance; evaluate available phosphorus in lake sediment.
7. Incorporate additional parameters into lake shoreline assessments by the LCHD to better quantify sediment and nutrient loads; this includes eroding bank height and estimated lateral recession rates. Collect lake bank soil cores to determine soil nutrient concentrations.

7.6 PLAN IMPLEMENTATION MILESTONES

This section includes goals, objectives, indicators, and milestones, consistent with implementation scorecards found in Appendix M. Table 7-19 through Table 7-25 list all consensus milestones established by the watershed planning committee. The "Objective ID" columns in Table 7-19 through Table 7-25 references Chapter 2, Section 2.4 goals (number) and objectives (letter).

7.6.1 WATERSHED GOAL #1 MILESTONES: WATER QUALITY IMPROVEMENTS

Improve water quality and prevent future pollution impacts to streams, lakes, ponds, and wetlands within the planning area. Timeframe: Short (**S**): 1-5 years, Medium (**M**): 6-10 years, Long (**L**): 10+ years.

Table 7-19: Water Quality Milestones

OBJECTIVE ID	INDICATOR	TIMEFRAME	MILESTONE
1a	Watershed stream annual monitoring program support. **Goal #1 Actions 1-4**	**S**	Continue water quality monitoring through DRWW monitoring program
		M	
		L	
		S	1. Enroll 15 lakes in the Volunteer Lake Monitoring Program (VLMP) 2. Install staff gages

OBJECTIVE ID	INDICATOR	TIMEFRAME	MILESTONE
	Implementation of watershed monitoring program for lakes. **Goal #1 Actions 5-7**		3. Begin Lake inlet water quality monitoring
		M	1. Enroll 30 lakes in the Volunteer Lake Monitoring Program 2. Analysis of monitoring and VLMP data 3. Estimate/assess nutrient loads from watershed for 5 lakes with sufficient data.
		L	1. Enroll 40 lakes in the Volunteer Lake Monitoring Program 2. Analysis of 5-10 year water quality trends for lakes with sufficient data
1b	Number of water bodies removed from the Illinois EPA's impairments list. **Goal #1 Actions 1-10**	**S**	2 Lakes / 1 stream segment
		M	6 Lakes / 3 stream segments
		L	30 Lakes / 6 steam segments
	Number of causes of impairment removed. **Goal #1 Actions 1-7**	**S**	5 lakes / 2 streams
		M	10 lakes / 5 streams
		L	40 lakes / 13 streams
1c	Winter Maintenance Program establishment including: policy and manual development, de-icing workshop attendance and certification. **Goal #1 Actions 8-9**	**S**	20% of municipal programs
		M	40% of municipal programs
		L	100% of municipal programs
1d	Number of local units of government that adopt a phosphorous ordinance. **Goal #1 Action 14**	**S**	8
		M	20
		L	All municipalities
	Number of exceedances of permitted phosphorus concentrations from wastewater treatment plant effluent.	**S**	0% reduction in exceedances
		M	25% reduction in exceedances
		L	50% reduction in exceedances

OBJECTIVE ID	INDICATOR	TIMEFRAME	MILESTONE
	Goal #1 Action 16		
	Number of agricultural BMPs implemented that target phosphorous. **Goal #1 Action 10**	**S**	1) 5 acres grass conversion 2) 10 WASCOBs 3) 5 equestrian facility/ livestock operations 4) 5 grass waterways 5) 250 acres no-till and cover crops 6) 5 field borders
		M	1) 10 acres grass conversion 2) 10 WASCOBs 3) 10 equestrian facility/ livestock operation 4) 10 grass waterways 5) 1,000 acres no-till and cover crops 6) 10 field borders
		L	1) 5 acres grass conversion 2) 10 WASCOBs 3) 10 equestrian facility/ livestock operations, 4) 10 grass waterways, 5) 3,000 acres no-till and cover crops 6) 10 field borders
	Number of upgraded septic systems. **Goal #1 Action 15**	**S**	500
		M	1,200
		L	2,000
	Number of municipalities that have codes that allow or require green infrastructure for stormwater management. **Goal #1 Actions 11-13**	**S**	8
		M	20
		L	All municipalities
1e	Number of dams and impoundments removed or retrofitted. **Goal #1 Actions 17-18**	**S**	1
		M	2
		L	3
1f		**S**	10%

OBJECTIVE ID	INDICATOR	TIMEFRAME	MILESTONE
	Reduction in concentrations of total suspended solids (TSS). **Goal #1 Action 19**	**M**	20%
		L	45%
	Linear feet of streambank and shoreline restored. **Goal #1 Action 20**	**S**	5,000 linear ft
		M	15,000 Linear ft
		L	30,000 Linear ft
1g	Number of algae blooms reported. **Goal #1 Action 21**	**S**	Quantify baseline number of algae blooms
		M	10% reduction
		L	20% reduction
1h	Percentage of identified sources of fecal coliform addressed. **Goal #1 Actions 22-24**	**S**	Identify and quantify sources of fecal coliform pollution
		M	50% addressed
		L	75% addressed
1i	Concentration of PAHs detected in water quality/sediment monitoring efforts. **Goal #1 Action 25**	**S**	Identify locations of high PAH concentrations
		M	Develop a management and remedial action plan
		L	Plan Implementation
1j	Number of MS4 communities maintaining a database of pollution prevention plans that address emergency response to catastrophic events. **Goal #1 Actions 26-27**	**S**	10
		M	20
		L	All
1k	Number of action recommendations completed.	**S**	50

OBJECTIVE ID	INDICATOR	TIMEFRAME	MILESTONE
	Goal #1 Actions 28-43	**M**	100
		L	All

7.6.2 Watershed Goal #2 Milestones: Regional Green Infrastructure and Natural Resources

Protect, enhance, and restore natural resources (soil, water, plant communities, and fish and wildlife) by employing good natural resource management practices. Using green infrastructure on public and private properties to maintain, enhance, or restore natural hydrology, native plant and wildlife communities, provide buffers for streams, lakes, wetlands, and high-quality areas. Expand environmental corridors to provide ecological, educational, and recreational benefits. Timeframe: Short (**S**): 1-5 years, Medium (**M**): 6-10 years, Long (**L**): 10+ years.

Table 7-20: Green Infrastructure and Natural Resources Milestones

OBJECTIVE ID	INDICATOR	TIMEFRAME	MILESTONE
2a	Number of water bodies removed from the Illinois EPA's impairments list. **Goal #1 Actions 1-10**	**Addressed by Objective ID 1b (1)**	
	Number of causes of impairment removed. **Goal #1 Actions 1-7**	**Addressed by Objective ID 1b (2)**	
	Area of open space identified and preserved for environmental and recreational natural areas. **Goal #2 Actions 17-24**	**S**	1,000 acres (in addition to 2018 baseline of 27,000 acres preserved)
		M	2,000 acres (in addition to 2018 baseline of 27,000 acres preserved)
		L	3,000 acres (in addition to 2018 baseline of 27,000 acres preserved)
	Acres of invasive species removal/management projects.	**S**	2,500
		M	5,000

OBJECTIVE ID	INDICATOR	TIMEFRAME	MILESTONE
	Goal #2 Actions 28-29	**L**	10,000
2b	Area of degraded natural communities restored. **Goal #2 Actions 1-3, 6, 7-11, 15, 16, 23, and 25-28**	**S**	1,000 acres
		M	5,000 acres
		L	20,000 acres
2c	Length of native plant buffers along water bodies maintained, expanded, and/or restored. **Goal #2 Actions 12-13**	**S**	10 miles
		M	20 miles
		L	50 miles
2d	Acres of wetlands enhanced and/or restored. **Goal #2 Actions 14-15**	**S**	500 acres
		M	1,500 acres
		L	3,000 acres
2e	Area of open space identified and preserved for environmental and recreational natural areas. **Goal #2 Actions 17-24**	**Addressed by Objective ID 2a**	
2f	Number of new trail connections. **Goal #2 Action 25**	**S**	5
		M	10
		L	20
2g	Number of lake management plans developed to address aquatic resource trends based on lake reports. **Goal #2 Action 26**	**S**	5 plans
		M	10 plans
		L	25 plans

OBJECTIVE ID	INDICATOR	TIMEFRAME	MILESTONE
	Number of lake management plan project recommendations implemented. **Goal #2 Action 26**	**S**	5 plans
		M	5 projects implemented
		L	10 projects implemented
2h	Number of lakes with Aquatic Plant Management Plans (APMP). **Goal #2 Action 27**	**S**	5
		M	10
		L	25
2i	Acres of invasive species removal/management projects. **Goal #2 Actions 28-29**	**Addressed by Objective ID 2a**	
2j	Number of successful reintroductions of threatened and endangered native species into natural habitats. **Goal #2 Action 30**	**S**	1 attempted
		M	5 attempted
		L	2 successful

7.6.3 Watershed Goal #3 Milestones: Flood Damage Reduction

Reduce current flood damage in the DPR planning area and prevent future flooding from worsening in the watershed and along the Des Plaines River downstream of Lake County. Timeframe: Short (**S**): 1-5 years, Medium (**M**): 6-10 years, Long (**L**): 10+ years.

Table 7-21: Flood Damage Reduction Milestones

OBJECTIVE ID	INDICATOR	TIMEFRAME	MILESTONE
3a	Area of new or restored flood storage sites. **Goal #3 Actions 1-9**	**S**	25 acres
		M	50 acres
		L	100 acres
3b		**S**	10

OBJECTIVE ID	INDICATOR	TIMEFRAME	MILESTONE
	Number of flood problem areas positively affected by flood mitigation projects implemented. **Goal #3 Actions 1-9**	**M**	20
		L	30
3c	Number of flood insurance policies in the watershed communities. **Goal #3 Action 24**	**S**	Track number of NFIP policies
		M	Track number of NFIP policies
		L	Track number of NFIP policies
	Number of Lake County Floodproofing Workshop attendees. **Goal #7 Actions 1-2, 4-5, 9, 13, 17-18**	**S**	300
		M	600
		L	900
3d	Number of action recommendations completed. **Goal #1 Actions 28-43** **Goal #3 Actions 6-9**	**Addressed by Objective ID 1k**	
3e	Number of mapped overland flow routes. **Goal #3 Action 10**	**S**	1 subwatershed
		M	5 subwatersheds
		L	All 10 subwatersheds
3f	Number of municipalities that have codes that allow or require green infrastructure for stormwater management. **Goal #1 Actions 11-13**	**Addressed by Objective ID 1d**	
3g	Number of local drainage system improvement projects implemented. **Goal #3 Actions 1-10, 22, 25**	**S**	25
		M	50
		L	100

OBJECTIVE ID	INDICATOR	TIMEFRAME	MILESTONE
3h	Number of communities with established stream maintenance programs. **Goal #3 Action 18**	**S**	10
		M	15
		L	All municipalities
3i	Number of updated FEMA floodplain maps (less than 10 years old). **Goal #3 Actions 19-21**	**S**	2
		M	5
		L	Entire planning area
3j	Number of Voluntary Floodplain Buyouts. **Goal #3 Action 22**	**S**	20
		M	50
		L	400
3k	Number/value of claims filed each year per community in the watershed. **Goal #3 Actions 24**	**S**	Reduce by 5%
		M	Reduce by 10%
		L	Reduce by 25%

7.6.4 Watershed Goal #4 Milestones: Funding, Installing, and Maintaining Stormwater Infrastructure

Reduce the volume and improve the quality of stormwater runoff by installing appropriate gray or green stormwater infrastructure; improving the condition of existing stormwater infrastructure. Timeframe: Short (**S**): 1-5 years, Medium (**M**): 6-10 years, Long (**L**): 10+ years.

Table 7-22: Stormwater Infrastructure Milestones

OBJECTIVE ID	INDICATOR	TIMEFRAME	MILESTONE
4a	Number of action recommendations completed. **Goal #1 Actions 28-43** **Goal #3 Actions 6-9** **Goal #4 Actions 2-4**	**Addressed by Objective ID 1k**	
4b		**S**	5

OBJECTIVE ID	INDICATOR	TIMEFRAME	MILESTONE
	Number of cost-sharing programs available in the DPR planning area. **Goal #4 Actions 5-7, 9**	**M**	7
		L	10
	Amount of grant funding available for stormwater green infrastructure and BMPs. **Goal #4 Actions 5 and 9**	**S**	$2,500,000
		M	$3,000,000
		L	$5,000,000
4c	Number of municipalities that have codes that allow or require green infrastructure for stormwater management. **Goal #1 Actions 11-13** **Goal #4 Actions 8-9, 11**	**Addressed by Objective ID 3f**	
4d	Number of local, county, and state representatives provided educational outreach materials for improving local and countywide regulations. **Goal #4 Action 9**	**S**	20
		M	40
		L	50
4e	Funding increase for in-the-ground stormwater BMPs. **Goal #4 Actions 5 and 9**	**S**	10% increase from 2018 baseline
		M	10% increase from 2018 baseline
		L	20% increase from 2018 baseline
4f	Number of existing stormwater management structures retrofitted. **Goal #4 Actions 10-11**	**S**	30
		M	100
		L	500
		S	30

OBJECTIVE ID	INDICATOR	TIMEFRAME	MILESTONE
	Number of developments built using conservation design principles and/or green infrastructure. **Goal #2 Action 19** **Goal #3 Action 11-15** **Goal#4 Action 4, 8**	**M**	60
		L	80
4g	Potential maintenance needs identified in future stream and detention basin inventories. **Goal #3 Action 18** **Goal #4 Action 11, 15**	**S**	N/A
		M	10% aggregate reduction from 2018 baseline
		L	20% aggregate reduction from 2018 baseline
4h	Number of communities with established stream maintenance programs. **Goal #3 Action 18**	**Addressed by Objective ID 3h**	
4i	Lane miles of roadway retrofitted or constructed with BMPs. **Goal #4 Actions 12-13**	**S**	5 miles
		M	10 miles
		L	15 miles
4j	Number of informational guides on roles and responsibilities for stormwater gray/green infrastructure maintenance distributed. **Goal #7 Action 9**	**S**	2,000
		M	5,000
		L	10,000
4k	Number of compliant site inspections performed during the 10-year operation and maintenance period for Illinois EPA 319 grant funded projects. **Goal #4 Actions 14-16**	**S**	All 319 grant funded projects
		M	All 319 grant funded projects
		L	All 319 grant funded projects

7.6.5 Watershed Goal #5 Milestones: Community and Agency Coordination

Improve coordination, research, and decision-making among public, private, and nonprofit entities to help achieve watershed plan goals and objectives. Timeframe: Short (**S**): 1-5 years, Medium (**M**): 6-10 years, Long (**L**): 10+ years.

Table 7-23: Community and Agency Coordination Milestones

OBJECTIVE ID	INDICATOR	TIMEFRAME	MILESTONE
5a	Number of municipalities, counties, and natural resource agencies that adopt the Des Plaines River Watershed-Based Plan. **Goal #5 Actions 1 and 2**	**S**	25 Agencies
		M	All agencies
		L	All agencies
5b	Watershed stream annual monitoring program support. **Goal #1 Actions 1-4** **Goal #5 Action 3**	**Addressed by Objective ID 1a**	
5c	Establishment of lead organization (watershed planning committee) with budget and executive committee. **Goal #5 Actions 4-6**	**S**	1 lead organization
		M	
		L	
	Number of projects advanced/undertaken with the support of the watershed planning committee. **Goal #5 Actions 7-8**	**S**	100 action plan recommendations
		M	250 action plan recommendations
		L	500 action plan recommendations
5d	Communities and organizations have designated an individual or board member(s) representative to participate on the watershed planning committee. **Goal #5 Action 4, 13**	**S**	10 communities
		M	20 communities
		L	All communities
5e		**S**	10

OBJECTIVE ID	INDICATOR	TIMEFRAME	MILESTONE
	Number of jurisdictions implementing watershed site-specific and programmatic actions. **Goal #5 Actions 9-11**	**M**	20
		L	All
5f	Number of jurisdictions that have ordinances and programs that protect and preserve watershed natural resource areas. **Goal #5 Actions 12-14**	**S**	10
		M	20
		L	All
	Number of municipalities that have codes that allow or require green infrastructure for stormwater management. **Goal #5 Actions 10, 14**	**Addressed by Objective IDs 3f & 4c**	
5g	Number of RiverWatch sites/lakes enrolled in volunteer/citizen scientist river and lake monitoring programs. **Goal #1 Action 2** **Goal #7 Actions 13**	**S**	25
		M	50
		L	75
5h	Number of watershed stakeholders providing feedback for the watershed report cards. **Goal #5 Action 15**	**S**	30
		M	100
		L	200

7.6.6 Watershed Goal #6 Milestones: Sustainable Agriculture Systems

Watershed stakeholders participate in farmland preservation programs and implement sustainable agricultural practices to accomplish other watershed goals and objectives. Timeframe: Short (**S**): 1-5 years, Medium (**M**): 6-10 years, Long (**L**): 10+ years.

Table 7-24: Sustainable Agricultural Systems Milestones

OBJECTIVE ID	INDICATOR	TIMEFRAME	MILESTONE
6a	Number and area of agricultural BMPs installed. **Goal #6 Actions 1-9**	**S**	25 BMPs cumulatively treating greater than 1,000 acres.
		M	50 BMPs cumulatively treating greater than 2,000 acres
		L	100 BMPs cumulatively treating greater than 5,000 acres
6b	Number or percent of farms, equestrian facilities, and nurseries with Resource Management Plans (assume 2018 baseline of 0). **Goal #6 Action 10**	**S**	5%
		M	25%
		L	50%
6c	Number of high priority sediment reduction agriculture BMPs installed. **Goal #6 Actions 11-12**	**S**	15
		M	30
		L	60
	Demonstration sites established and monitored. **Goal #7 Action 2, 7, 13**	**S**	3
		M	5
		L	7
	Length of drain tile removed or disabled. **Goal #6 Action 12**	**S**	5,000 ft
		M	10,000 ft
		L	30,000 ft
6d	Number of county and municipal agencies that have adopted a farmland preservation program(s). **Goal #6 Action 13**	**L**	Community dependent
6e	Acres of cover crops or crop residue left on fall agricultural fields.	**S**	5% of all conventional or reduced tilled fields (500 acres)

OBJECTIVE ID	INDICATOR	TIMEFRAME	MILESTONE
	Goal #6 Action 1, 8, 10, 13	**M**	25% of all conventional or reduced tilled fields (2,500 acres)
		L	50% of all conventional or reduced tilled fields (5,000 acres)
	Acres of waterway, wetland, WASCOB, field border, filter strip, GSS and other erosion control agriculture BMPs that are implemented, enhanced or restored. **Goal #6 Actions 1-9, 11-12**	**S**	1) 5 acres grass conversion 2) 10 WASCOBs, 3) 5 equestrian facility/livestock operations, 4) 5 grass waterways, 5) 250 acres no-till and cover crops, 6) 5 field borders 7) 5 acres filter strips, 8) 50 acres of wetlands 9) 10 nutrient management plans
		M	1) 10 acres grass conversion 2) 10 WASCOBs 3) 10 equestrian facility/livestock operations 4) 10 grass waterways 5) 1,000 acres no-till and cover crops 6) 10 field borders 7) 10 acres filter strips 8) 100 acres of wetlands 9) 50 nutrient management plans
		L	1) 5 acres grass conversion 2) 10 WASCOBs 3) 10 equestrian facility/livestock operations, 4) 10 grass waterways, 5) 3,000 acres no-till and cover crops, 6) 10 field borders, 7) 10 acres filter strips, 8) 200 acres of wetlands 9) 100 nutrient management plans
6f	Number of prime farmland acres in production. **Goal #6 Action 14**	**L**	75% of all prime farmland (2018 baseline)

7.6.7 Watershed Goal #7 Milestones: Education and Outreach

Provide watershed stakeholders with the knowledge, skills, and motivation needed to take action to implement the watershed plan. Watershed stakeholders include (but are not limited to): residents,

property owners, property owner associations, government agencies, jurisdictions, and developers. Timeframe: Short (**S**): 1-5 years, Medium (**M**): 6-10 years, Long (**L**): 10+ years.

Table 7-25: Education and Outreach Milestones

OBJECTIVE ID	INDICATOR	TIMEFRAME	MILESTONE
7a	Number of landowners that receive information about best practices for stream and lake shoreline restoration and maintenance. **Goal #7 Action 1-2, 4, 13**	**S**	500
		M	500
		L	2,000
7b	Number of people reached by watershed outreach campaign. **Goal #7 Actions 2, 4, 10-11, 16**	**S**	Establish outreach campaign
		M	5,000
		L	10,000
7c	Number of public agencies and local private contractors attending the annual Lake County De-icing Workshop. **Goal #1 Actions 8-9** **Goal #7 Action 3**	**S**	20 public agencies; 100 local private contractors
		M	35 public agencies; 150 local private contractors
		L	All public agencies with winter maintenance responsibilities; 200 local private contractors
	Number of public agencies with winter maintenance responsibilities that use alternative de-icing products. **Goal #1 Actions 8-9** **Goal #7 Action 3**	**S**	20
		M	35
		L	All
7d	Number of property owners that receive information about the importance of watershed health.	**S**	2,000
		M	5,000
		L	10,000

OBJECTIVE ID	INDICATOR	TIMEFRAME	MILESTONE
	Goal #7 Actions 2, 4, 11		
	Number of landowners that receive information about watershed programs and projects.	**S**	2,000
		M	5,000
	Goal #7 Actions 2, 10, 12	**L**	10,000
	Number of workshops.	**S**	10
		M	20
	Goal #7 Actions 13, 16, 18	**L**	30
7e	Number of action recommendations completed. **Goal #1 Actions 28-43** **Goal #3 Actions 6-9** **Goal #4 Actions 2-4** **Goal #7 Actions 20-21**	**Addressed by Objective IDs 1k**	
	Continuous increase in number of contacts on the SMC Des Plaines River watershed contact database.	**S**	5% increase
		M	7% increase
	Goal #7 Actions 2, 4, 10-11, 16	**L**	10% increase
7f	Pollution prevention campaign established.	**S**	Establish campaign
		M	Maintain campaign
	Goal #7 Actions 2-5, 8, 17, 22	**L**	Maintain campaign
7g	Number of volunteers for lake, stream, and natural area stewardship and maintenance.	**S**	500
		M	500
	Goal #7 Actions 13-14	**L**	1,000
7h		**S**	1 site / 1 training/yr.

OBJECTIVE ID	INDICATOR	TIMEFRAME	MILESTONE
	Number of native plant demonstration sites established, and trainings held. **Goal #7 Actions 15-16, 21-22**	**M**	2 sites / 2 trainings/yr.
		L	2 sites / 2 trainings/yr.
7i	Number of communities that adopt the "no adverse impact standard." **Goal #7 Action 17**	**S**	2
		M	5
		L	All applicable communities
7j	Number of educational flyers or mailings to high flood risk property owners about flood mitigation measures. **Goal #7 Action 18**	**M**	5,000
	Number of clicks (overall activity) on SMC website with flooding resources. **Goal #7 Action 4, 18**	**S**	5% increase in 2018 baseline
		M	7% increase in 2018 baseline
		L	10% increase in 2018 baseline
7k	Number of educational signs regarding aquatic invasive species installed. **Goal #7 Actions 20-22**	**S**	10
		M	20
		L	At least one sign at every lake with public access

7.7 UPDATING THE WATERSHED-BASED PLAN

Watershed-based plans are required by the Illinois EPA to be updated every 10 years. Furthermore, the watershed-based plan should be revised, as necessary, as new information is received, and progress is made. For example, as DRWW monitoring efforts continue, additional data can be used to revise loading estimates and determine if implementation efforts are achieving stated goals, milestones, and reduction targets. The Des Plaines River Watershed-Based Plan is an umbrella document, and when major updates occur, existing subwatershed plans must also be updated. Plan updates do not require an entire rewrite; typical elements that will likely require a major update or revision are summarized in Table 7-26.

Table 7-26: Plan Update Elements and Responsibilities

MAJOR PLAN ELEMENT REQUIRING UPDATE	ELEMENT COMPONENT REQUIRING UPDATE	LEAD RESPONSIBLE ENTITY (S)	PRIMARY SUPPORTING PARTNERS
Watershed Characterization	• Land use information • Water quality data/analysis • Stream/lake impairments • Climate • Demographics • Jurisdictions • Pollution loading	Lake County SMC	• Jurisdictions (Chapter 6) • DRWW • Watershed Planning Committee and subwatershed planning groups
Action and Implementation Plan Components	• Project recommendations • Expected load reductions • Milestones, timeframes, and priorities • Responsible parties and support partners • Monitoring plan	Lake County SMC	• Jurisdictions (Chapter 6) • DRWW • Watershed Planning Committee and subwatershed planning groups

7.8 REFERENCES

Des Plaines River Watershed Workgroup (DRWW). 2015. Quality Assurance Project Plan (QAPP): Bioassessment of the Des Plaines River Watershed. Lake County, Illinois. Technical Report. 54 pp.

Midwest Biodiversity Institute (MBI). 2017. Biological and Water Quality Assessment of the Upper Des Plaines River and Tributaries 2016. Lake County, Illinois. Technical Report MBI/2017-8-7. Columbus, OH. 99 pp.